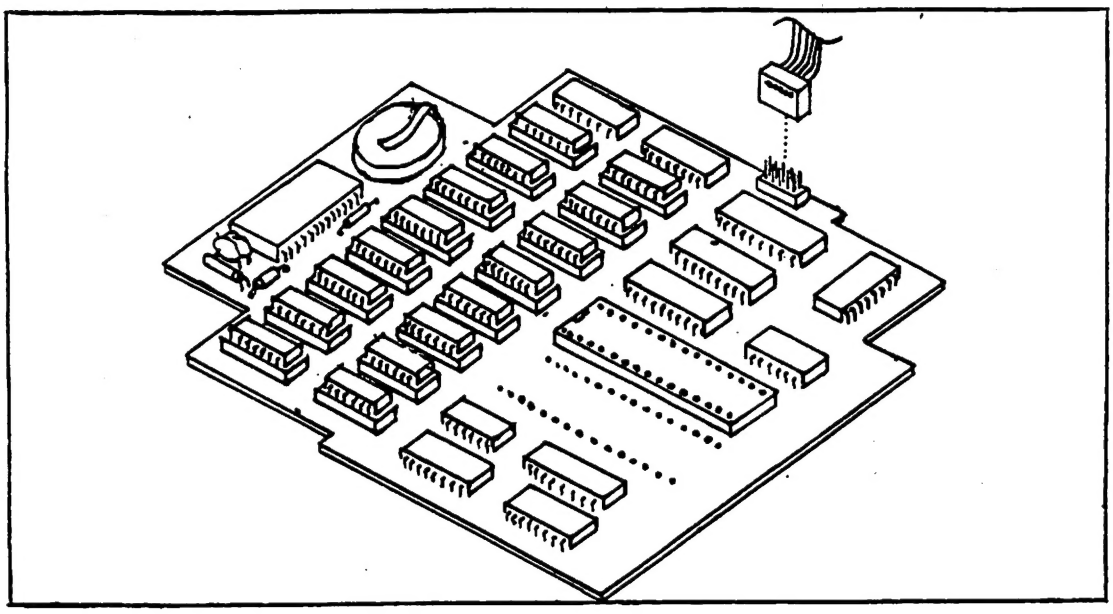
jr H O T S H O T

PCjr Internal Multi-Function Upgrade Card

I N S T A L L A T I O N A N D U S E R ' S G U I D E



- **O 512K or 256K FAST MEMORY**
- **O Real-Time CLOCK/CALENDAR with Lithium Battery Backup** (Optional feature)
- **O CONTROLLER AND CABLE for Second (External) Floppy Disk** (Optional feature)
- **O Compatible with other Memory Accessories and (non-DMA) Multi-Function Accessories**
- **O Internal Mounting, No Need for Additional Power Supply**

O Summary of How to Use jrHOTSHOT:

Plug the jrHOTSHOT board inside your PCjr as explained, and "install" the enclosed jrHOTSHOT configuration software onto a DOS disk. (DOS 2.0 or higher). Then re-boot DOS and DOS will recognize and use the fast memory and other features on jrHOTSHOT. Using jrHOTSHOT is really that easy!

ES QUALITY PRODUCTS INC.
2065 LAKESHORE DRIVE
CARSON CITY, NV 89704
(702) 849-2899

1.1 jrHOTSHOT 2-year Warranty

If the jrHOTSHOT board should fail within two years of use, contact us, send us the board, and we will fix or replace the board at no additional charge. (Even after two years, call and we will see what we can do.)

This does not cover broken pins. Broken pin replacement costs $6. However, we provided a small supply of metal pins so you can perform a pin replacement if needed. If a pin replacement is necessary, just cut away a bit of the plastic header to expose the pin, then unsolder the pin and pull out the broken pin. Put a new metal pin in its place, and re-solder it.

PART ONE: HARDWARE INSTALLATION

1.1 Installation Summary

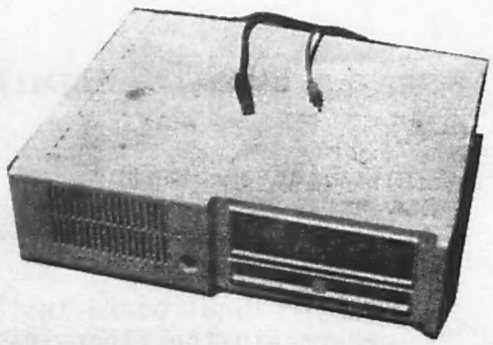
```
**********************************************************************
*                                                                    *
*   The jrHOTSHOT board installs inside the PCjr, tucked neatly      *
*   underneath the floppy disk drive.  jrHOTSHOT plugs into the      *
*   8088 microprocessor socket (located beneath the drive), and      *
*   the microprocessor then plugs into jrHOTSHOT.                    *
*                                                                    *
**********************************************************************
```

1.2 Step-by-Step Installation

* * * * * * * * * * * * * * PREPARATION * * * * * * *

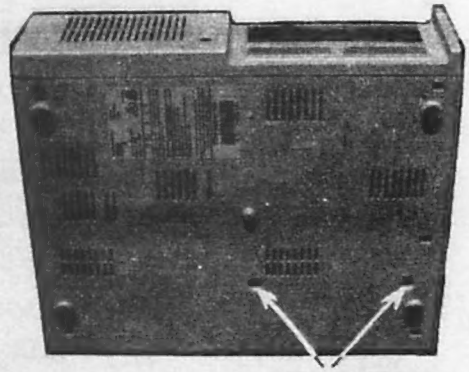
Verification

Before doing anything else, see that your PCjr is working normally. Then, turn it off and UNPLUG the cords for power, video and keyboard. Then put the computer on a solid surface. Use some form of padding beneath the computer and its surroundings to protect the computer and its parts from any accidental droppage.

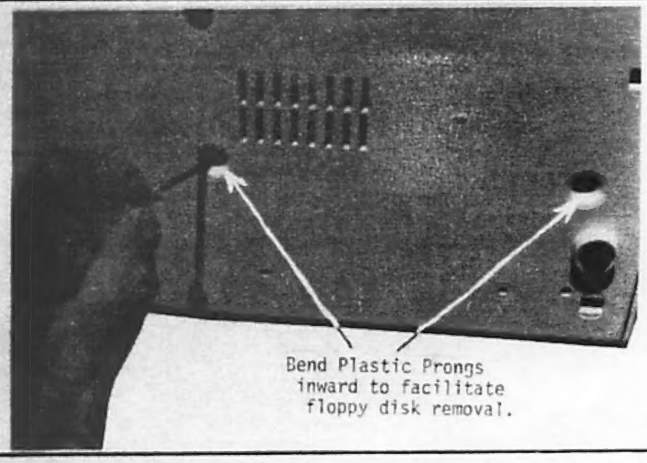


Loosen Plastic Clips that Hold the Floppy Disk Bracket

Underneath the PCjr are two indentations. In each one are plastic prongs in a star-like pattern. The prongs are part of a bracket that holds the floppy disk. To make removing the floppy drive easier, each of these prongs should be bent inward toward the center of the "star."



Plastic Prongs
from floppy disk bracket.

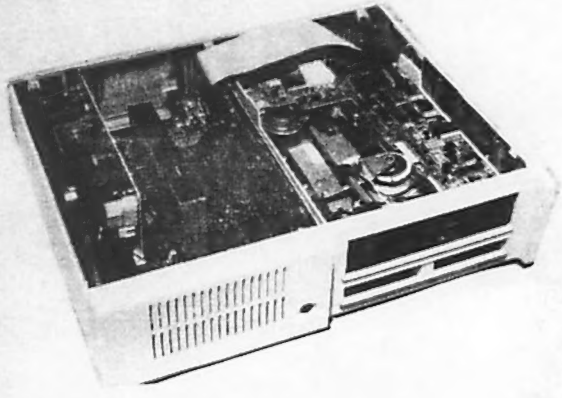


Bend Plastic Prongs
inward to facilitate
floppy disk removal.

Top Cover Removal

The top cover is removed by gently prying up the rear edge at the three rear notches. Remove the top cover entirely and put it aside.

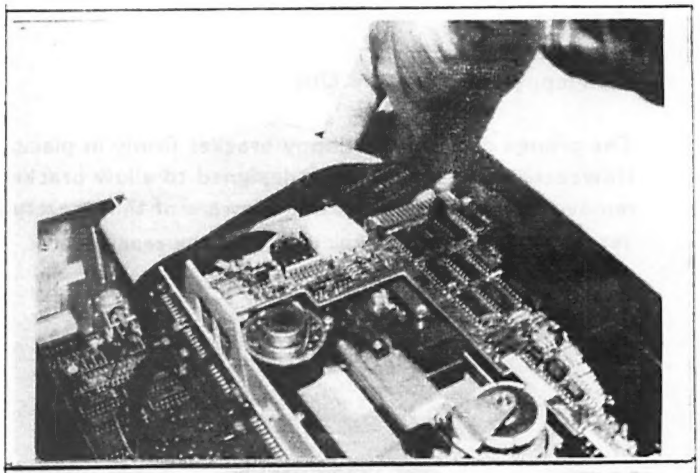
CAUTION: DO NOT TOUCH THE DELICATE DRIVE MECHANISM!



* * * * * * * * * * * * * * FLOPPY REMOVAL * * * * * * *

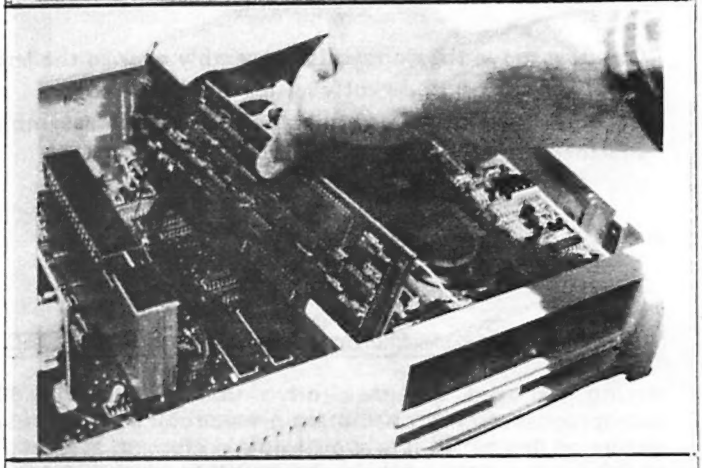
Survey the Scene

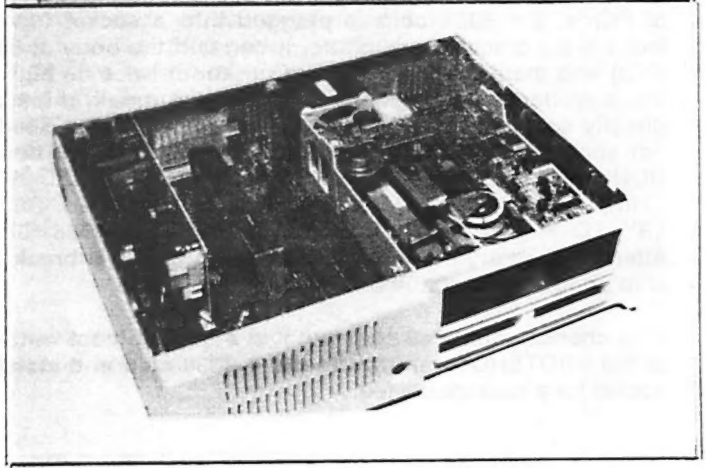
To install jrHOTSHOT, you first lift out the floppy drive (in its white plastic bracket that holds the drive).



Remove the Controller Board

Wiggle the flat cable from the rear of the floppy disk drive. Then wiggle the floppy disk controller board up and out of its socket on the main electronics board. Remove the controller board and cable as one assembly (no need to disconnect the flat cable from the disk controller board) and put it aside.

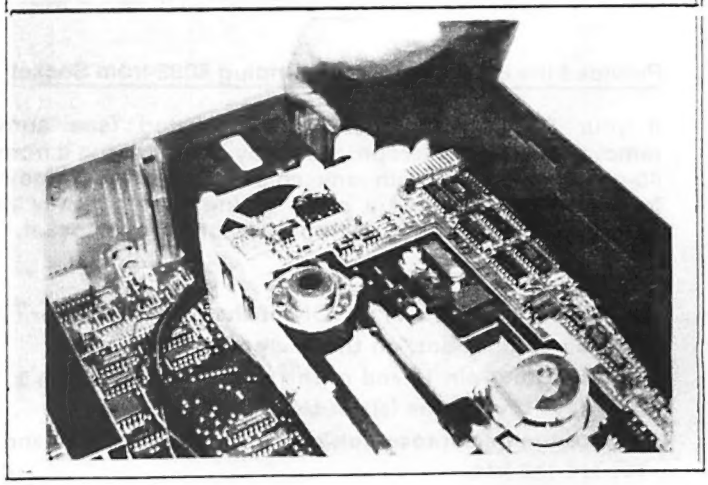




Loosen (pull up) the Floppy Drive Bracket

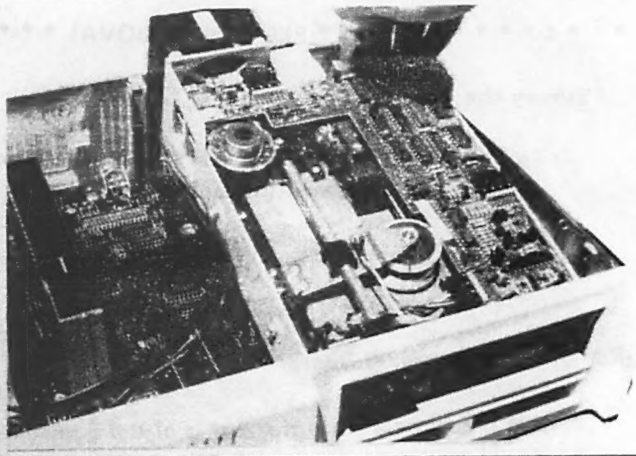
The plastic bracket (for the floppy disk) has two "feet" that rest on the main electronics board. These feet are anchored to the plastic case of the PCjr by plastic prongs that extend down from the feet and go through to the underside of PCjr case. In a previous step, you already bent these prongs inward to reduce their gripping force.

CAUTION: BE CAREFUL NOT TO TOUCH THE DRIVE MECHANISM!



Lift Floppy Drive Up and Out

The prongs do hold the floppy bracket firmly in place. However, these prongs were designed to allow bracket removal when necessary. Being aware of that, carefully reach beneath the bracket to lift up the rear edge of the bracket.

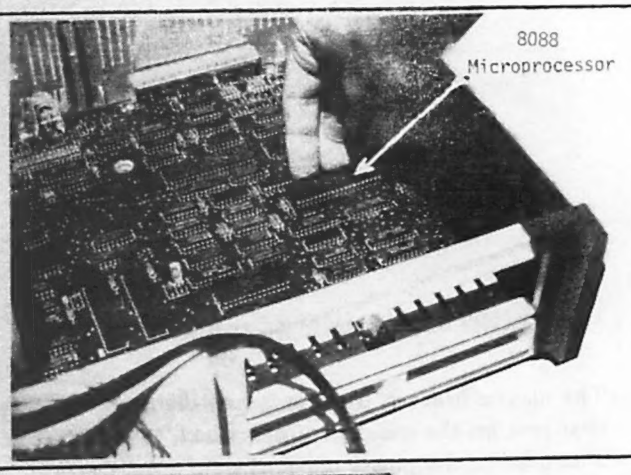


Carefully move the floppy disk assembly over to the left front of the PCjr and gently let it rest there. Just leave the wires attached while the floppy drive assembly sits there in front).

(Be Certain your 8088 Microprocessor chip is SOCKETED

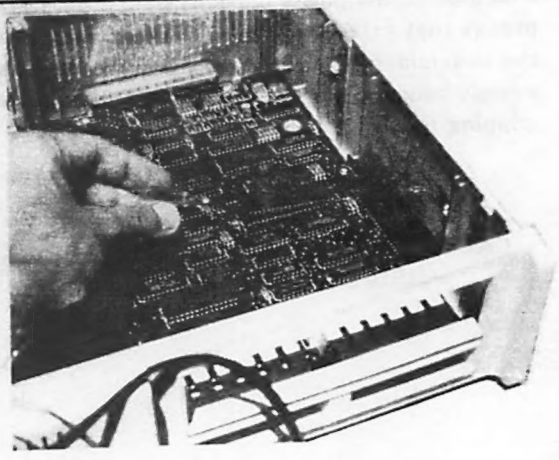
Having removed the disk drive unit, locate the 8088 microprocessor chip on the main electronics board, using picture on this page. It is a large 40-pin chip. In at least 98% of PCjr's, the 8088 chip is plugged into a socket (socket looks like a black plastic platform beneath the body of 8088 chip) and therefore the 8088 sits up about twice as high as the surrounding smaller black chips (the small chips are directly soldered to main board). However, if your 8088 is not socketed, but rather is soldered directly to the board, DON'T TRY TO REMOVE A DIRECTLY SOLDERED 8088 CHIP. In other words, if the 8088 is not socketed, DON'T TRY TO REMOVE A DIRECTLY SOLDERED 8088 CHIP. Attempting to pry out a directly soldered chip will break the chip or gouge the circuit board beneath the chip.

If by chance your 8088 chip is not in a socket, most vendors of the jrHOTSHOT can unsolder the 8088 chip and install a socket for a reasonable fee.



Provided the 8088 is Socketed, Unplug 8088 from Socket

If your 8088 microprocessor is socketed (see above), remove the 40-pin microprocessor by gently prying it from its 40-pin socket. As with any chip its pins are somewhat fragile. Therefore, use a small prying tool to gently work BOTH ENDS of the 8088 microprocessor from its socket.

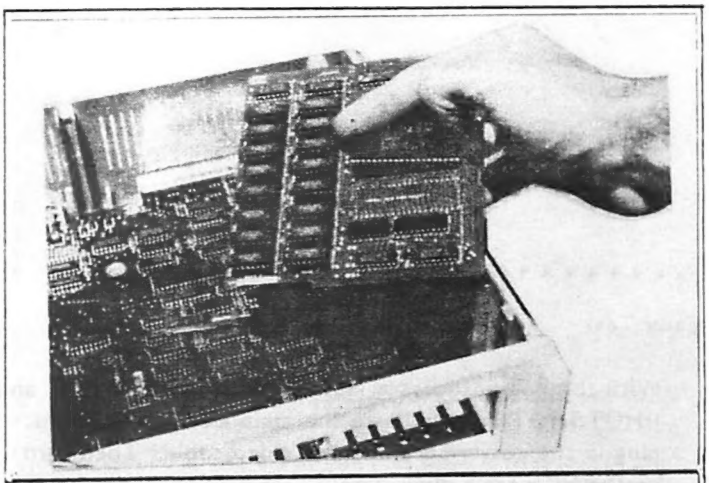


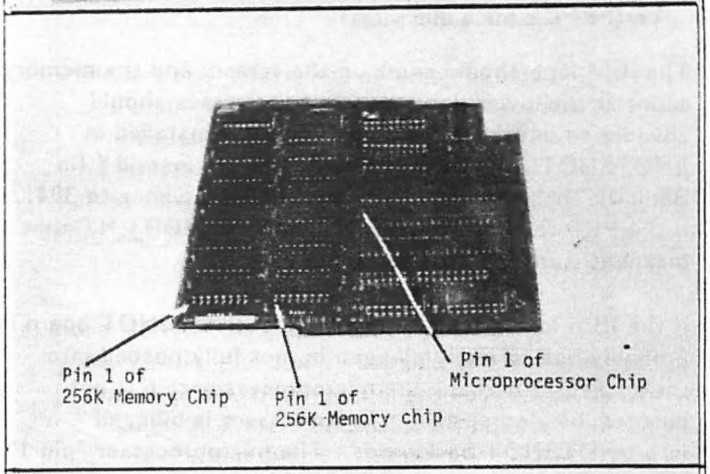
NOTICE THE ORIENTATION of the microprocessor. The visible notch, or dot, on the microprocessor body indicates the "pin 1" end of the chip. The 8088 "pin 1" is always toward the left of the PCjr. If you ever replace the microprocessor, do so with the notched end toward the left.

Plug Microprocessor into jrHOTSHOT

Now Plug 8088 Microprocessor onto jrHOTSHOT (unless jrHOTSHOT already has a V20 microprocessor plugged onto it)

The jrHOTSHOT has a 40-pin socket for the microprocessor. Unless you bought the jrHOTSHOT with a newer V20 microprocessor already plugged into that socket, you need to plug your existing 8088 microprocessor into that socket on the jrHOTSHOT. Therefore, if you are re-using the 8088 microprocessor, align the 8088 so its pin 1 is toward the left (see second picture this page). Then plug the microprocessor chip into socket on jrHOTSHOT board. Inspect visually. Make sure all 40 pins went into the socket. Be sure that no pins are sticking out. Be sure that no pins are bent underneath the body of the chip.





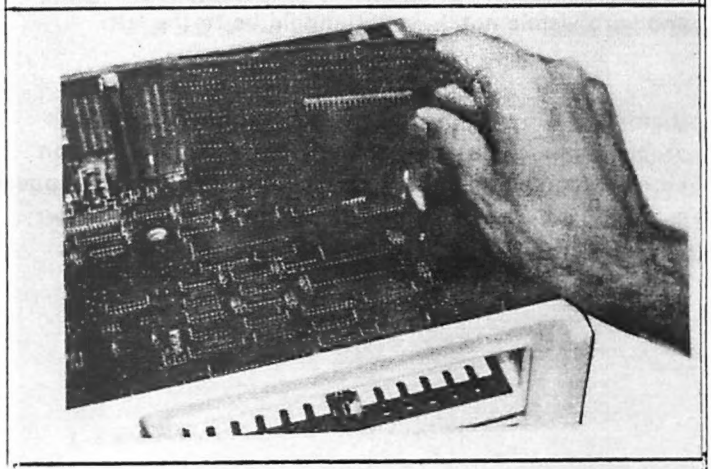
* * * * * * * * jrHOTSHOT CONNECTION * * * * * * *

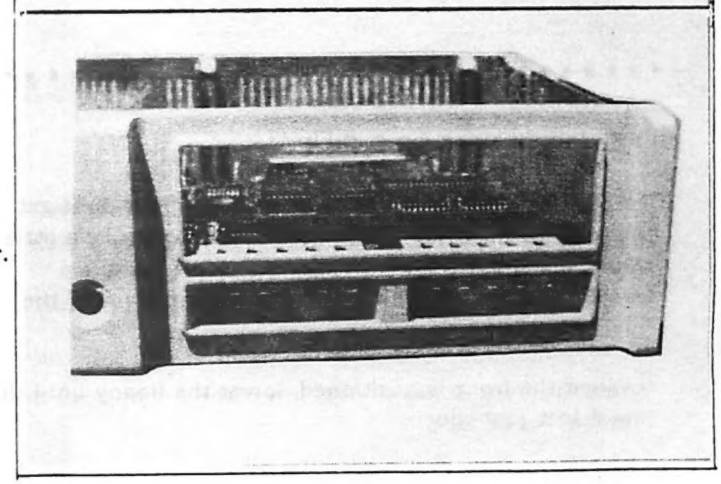
Plug jrHOTSHOT into Microprocessor Socket

Remove the Protective anti-static foam from the bottom pins of jrHOTSHOT. Move the jrHOTSHOT board near microprocessor socket. Then, for the "final approach," look into the PCjr through the floppy drive opening. Have bright lighting for good visibility.

Getting the alignment right requires care. Carefully align the board with the microprocessor socket and gently plug it in as you continue to look in from the front. Congratulations!

POINT OF CARE: Avoid installing jrHOTSHOT off-center.





* * * * * * * * * * QUICK TEST * * * * * * * * *

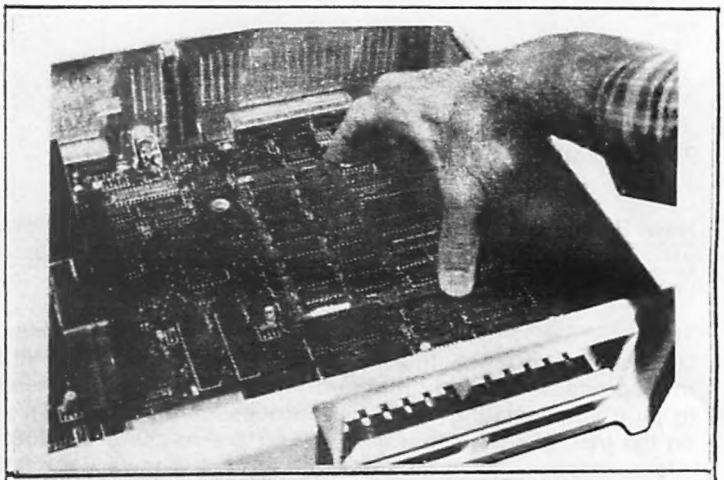
Early Test

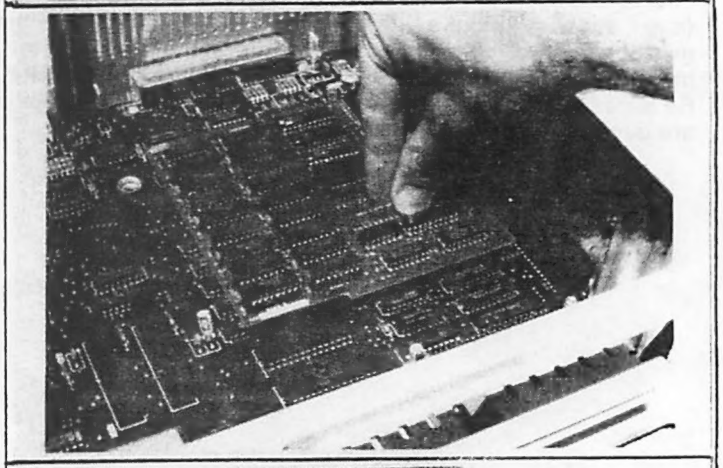
With the microprocessor installed into jrHOTSHOT, and jrHOTSHOT installed into the main electronics board, plug in the power cord and the video cable. Then turn on the PCjr for a quick test.

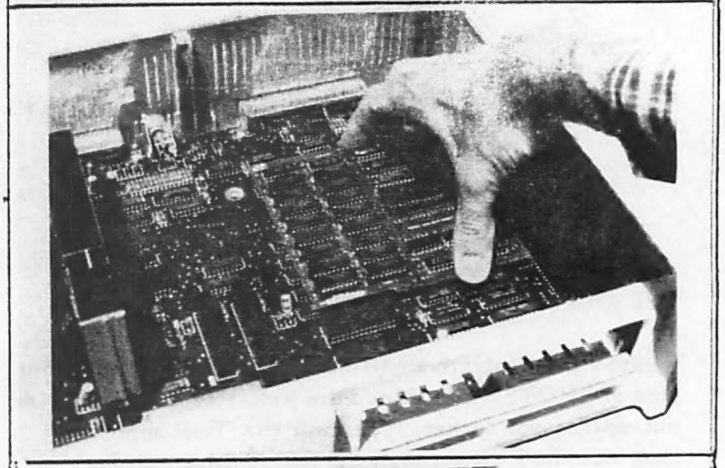
The IBM logo should come on the screen, and the memory count at the lower right corner of the screen should advance to 640K if 16 memory chips are installed in jrHOTSHOT. If only 8 memory chips are installed (in Bank 0), then the memory count should advance to 384. If the PCjr then beeps and/or signals "ERROR_H," that means it wants to access the floppy drive.

If the IBM logo does not appear, the jrHOTSHOT board is probably not correctly plugged in, not fully pushed into the socket, or perhaps the microprocessor chip is not plugged in. Perhaps the microprocessor is plugged into jrHOTSHOT backwards. The microprocessor "pin 1" end with visible notch or dot should be to the left.

If an "ERROR_A" message appears, a memory chip is probably bad or mis-plugged. Refer to the later section on replacing bad memory chips. If an "ERROR_B" appears, it indicates a keyboard connection problem; do not worry about an "ERROR_B" should it appear at this stage.





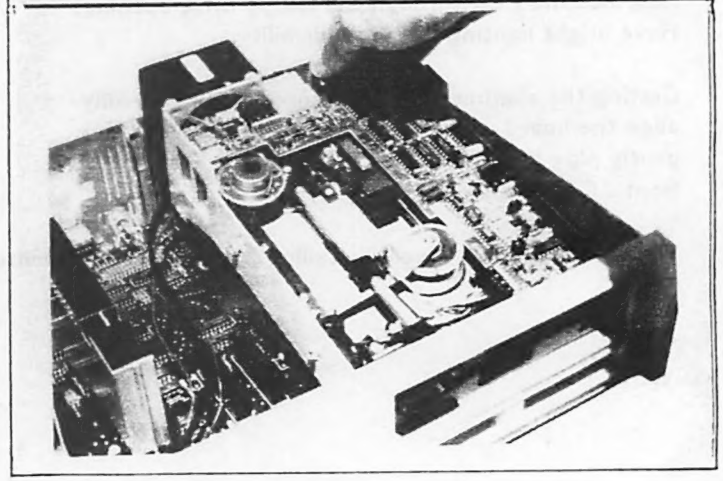


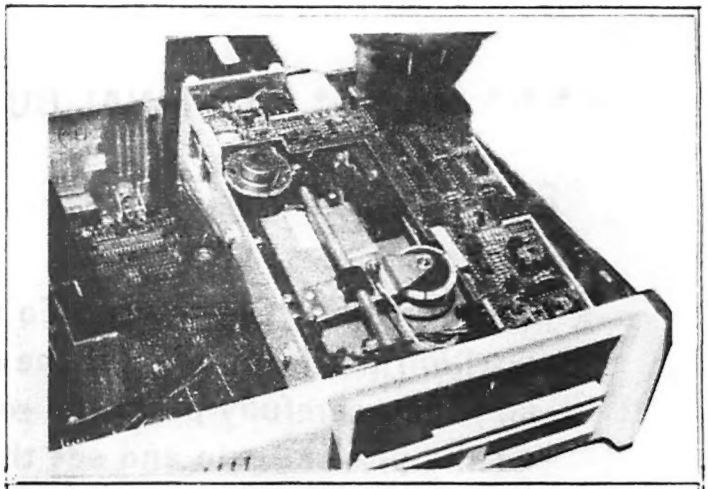
* * * * * * * * * * REPLACE FLOPPY DRIVE * * * *

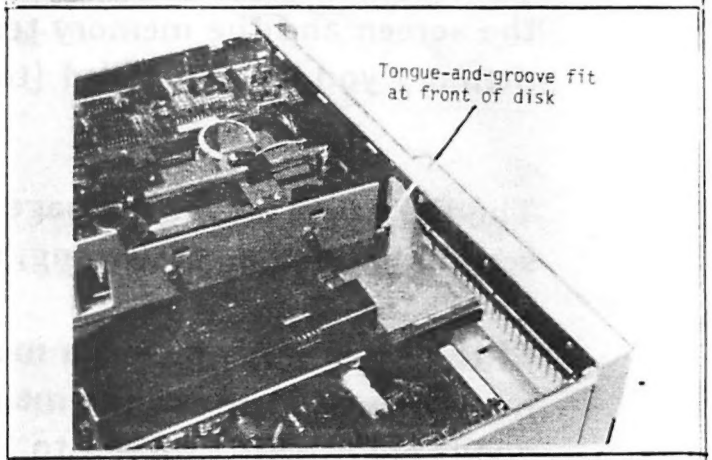
Front End of Floppy Goes in First

To place the floppy disk drive into the PCjr, first get the front of the drive positioned. That may be a little tricky, but don't force anything. Notice there is a tongue-and-groove fit along the bottom front of the floppy bracket.

When the front is positioned, lower the floppy until the rear feet just touch.

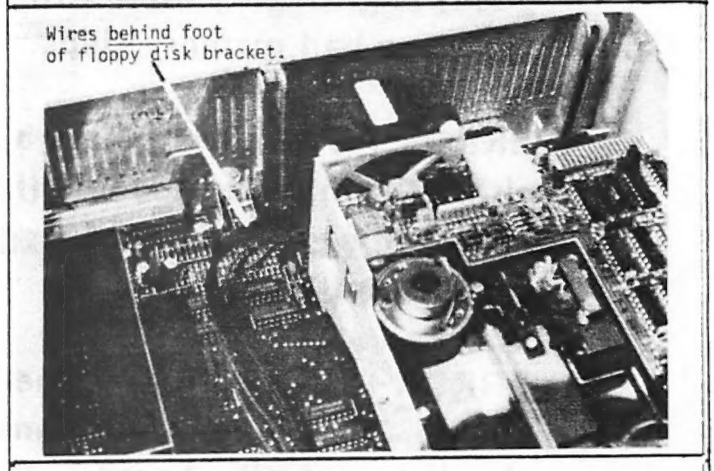






Route Power Wires and Fan Wires Behind Floppy Bracket

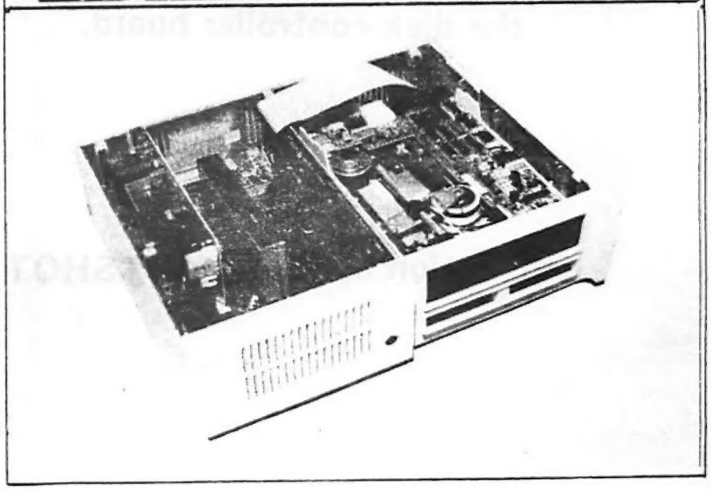
The internal power wires and thin fan wires to the floppy should be routed BEHIND the foot of the floppy bracket. Also keep them from being pinched by the metal bracket at the inner rear wall of the PCjr. When the wires are routed properly to allow plugging the floppy disk bracket, place your thumb on the bottom of the bracket foot. Push each foot down to fully seat the floppy bracket against the electronics board.



Install the Disk Controller Board

Position the floppy power cable so the disk controller board holds it down as the controller board is plugged into the main PCjr electronics board. Then plug the controller board in, and also re-connect the flat cable to the rear of the floppy disk drive.

All internal wires should be connected now. If not, connect them.



* * * * * * * * * * * FINAL BUTTON-UP * * * * * * * *

Replace Top Cover

Turn off the PCjr power. To re-attach the top cover, position the front edge of the cover into place first and then carefully press the rear edge into place. Turn on the power again and see that the IBM logo appears on the screen and the memory test continues as high as the memory you have installed (to 384K or 640K).

The PCjr posts error message (if any) to the video screen if something is wrong, such as:

ERROR__A - this means a memory chip is probably bad or mis-plugged. Inspect the memory chips carefully (in good, bright light). Refer to the later section on replacing bad memory chips.

ERROR__B - this indicates a keyboard connection problem; either the infra-red module (for receiving the wireless keyboard signals) is not plugged in, or the keyboard cable is not plugged in.

ERROR__H - this means the floppy is not responding as it should. Check all connections of the floppy drive and the disk controller board.

Installation of your jrHOTSHOT hardware is now complete.

PART TWO: INSTALLING THE MEMORY SOFTWARE ONTO YOUR DOS DISK

2.1 Installing the Memory Driver Software

The Memory Driver Software is on a Diskette labeled "jrHOTSHOT Version 3.2". We provide the software driver known as JRCONFIG, but any brand of memory software driver (such as IBM's driver that came with IBM memory "sidecar" units) will recognize the entire jrHOTSHOT memory just fine.

The memory software allows the PCjr to recognize the additional memory you have installed. Therefore you need to copy several small files from the jrHOTSHOT diskette onto the DOS disk that you use to boot up the computer.

You only have to perform this software "installation" procedure once. With the jrHOTSHOT board plugged in, boot up your computer using your working copy of your DOS disk. Take the write-protect tab off the DOS disk so you can install the memory software files onto your DOS disk.

When you have the DOS prompt, (A>:), place the jrHOTSHOT disk in the drive (drive A: if you have two drives). Also have your DOS disk on hand (have the DOS disk in drive B: if you have two drives).

Now, to install the memory software:

Place the jrHOTSHOT disk in the drive and type the command
INSTALL
and press the Enter (↵) key. Then follow the directions on the computer screen.

The directions on the screen allow you to copy the memory software driver to your DOS disk. The memory driver software JRCONFIG.SYS is copied to your DOS disk. Also, a CONFIG.SYS file and AUTOEXEC.BAT file are copied to your DOS disk.

You can use this install procedure for as many bootable DOS disks as you want to contain the memory driver software.

When you are finished doing the software installation you can re-boot DOS. Then, DOS will know that additional memory is present.

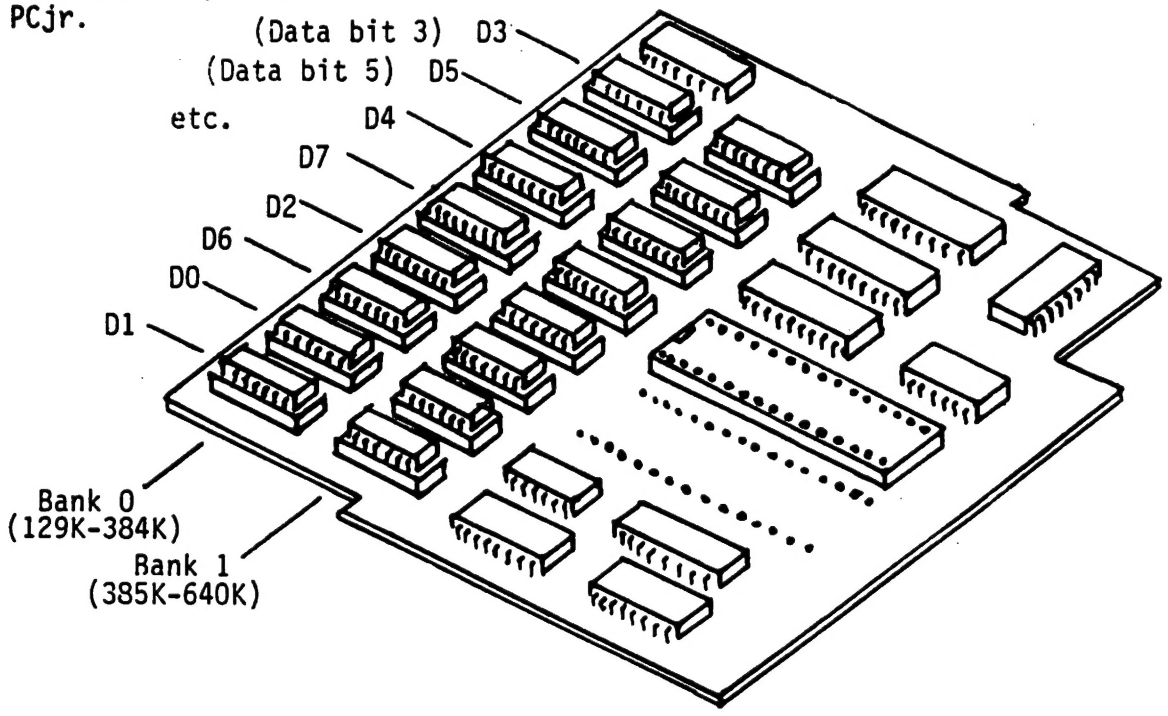
4.1 Replacing Defective Memory Chips

```
**************************************************************************
*  For the memory to function properly, you must use the type of         *
*  256K memory chips that support "CAS before RAS refresh."  Other-      *
*  wise the system will probably not run reliably in the FAST or         *
*  DISKFAST configurations.                                              *
**************************************************************************
```

The jrHOTSHOT fast memory board is populated with 256K x 1 dynamic memory chips. The 256K chips must have an access time spec of 150ns or less. Use chips such as Hitachi HM50256-15. 64K chips cannot be used. Each "bank" of 256K chips is made of 8 chips (the PCjr has no parity bit as does the PC) and provides approximately 256,000 bytes (characters) of memory. The board contains two "banks" and thus can hold up to 16 of the 256K memory chips, adding 521,288 bytes of memory to the PCjr.

A memory error is indicated either (1) when the PCjr self-test will not scan up the top of your jrHOTSHOT memory (up to either 384K or 640K) and boots immediately after reaching the 128K or 384K point, ignoring additional memory you have installed, or, (2) when the self-test reports an ERROR_A while the memory self-test is in progress.

A MEMORY DIAGNOSTIC PROGRAM, named "memtest.exe", has been supplied on your jrHOTSHOT disk. Running memtest will test all the jrHOTSHOT fast memory and pinpoint any defective memory chips. The memtest cannot pinpoint failures in the surrounding jrHOTSHOT control chips, unfortunately. It cannot test the lowest 128K of memory already in the PCjr.



jrHOTSHOT Diagram showing
Memory Chip Layout
(as called out by memtest diagnostic)